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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,770	04/09/2001	Michael G. Giovinco	10857-009001	9770

26161   7590   05/04/2005

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EXAMINER
TRAN, TAM D

ART UNIT	PAPER NUMBER
2676	

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/828,770	GIOVINCO ET AL.
	Examiner	**Art Unit**	
	Tam D Tran	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>03</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>2/25/2004</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-26 and 28-30</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-9, 12-24 and 28-30</u> is/are rejected.

7)☒ Claim(s) <u>10, 11, 25 and 26</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 12-24, 28-30, are rejected under 35 U.S.C. 102(b) as being anticipated by Soltan et

al. (USPN 6052100), hereinafter simply Soltan.

2.   In regard to claims 1, 16, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, said method

comprising: positioning a screen at a first angular position in which said screen is coplanar with

an entry plane; see Fig.10, selecting a first voxel (the cursor is composed of voxels, when the

cursor edge intersects the plane 63 a first voxel is selected) corresponding to an intersection of

said desired line with said entry plane (range rings 63, 64 defining a plane, intersection of the

edge and the plane will occur when user move the cursor cube onto the plane); selecting a second

voxel (second voxel corresponds to second edge voxel of the points that intersects the plane 63)

corresponding to a projection onto said entry plane of an intersection of said desired line with an

exit plane intersecting said entry plane (range rings 63, 64 defining a plane, intersection of the

edge and the plane will occur when user move the cursor cube onto the plane); see Fig.10, col.16

lines 35-50; defining a connecting segment that connects said first voxel and said second voxel

(finite lengths of the cube defining the edges of the cube, which are straight lines corresponding

to connecting segment that connects first voxel and second voxels); see Fig.10 col.16 lines 45-

50; and rendering selected voxels on said screen to rasterize said connecting segment; see Fig.10

col.16 lines 15-50.

3.   In regard to claims 2, 17, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, wherein rendering

said selected voxels comprises uniformly illuminating said selected voxels. See Fig.10 col.16

lines 45-50.

4.   In regard to claims 3, 18, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, wherein rendering

said selected voxels comprises rendering said selected voxels according to a selected

illumination pattern. See Fig.10 col.16 lines 45-50.

5.   In regard to claims 4, 19, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, further comprising

selecting said illumination pattern to assign an illumination level of at least one of said selected

voxels to be substantially zero. It is inherent that a certain amount of luminance voxels appears

to be zero to define finite lines.

6.   In regard to claims 5, 20, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, further comprising

selecting said at least one of said selected voxels from a group consisting of said first voxel and

said second voxel (line is set of voxels corresponding to group of voxels). See Fig.10 col.16 lines

45-50.

7.   In regard to claims 6, 21, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, further comprising

continuing to render said selected voxels while rotating said screen from a first angular position

in which said screen is coplanar with said entry plane to a second angular position in which said

screen is coplanar with said exit plane (motor imparts a periodic motion to display surface). See

Fig.11, col.8 lines 15-20.

8.   In regard to claims 7, 22, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, wherein selecting

said first voxel comprises: obtaining constants that define said line in Cartesian coordinates

(constants are theta, q, and P); obtaining an angle descriptive of said angular position of said

entry plane (theta); and on the basis of said constants and said angle, performing a trigonometric

to transformation to determine cylindrical coordinates of said intersection of said desired line

with said entry plane. See col.10 lines 1-67.

9.   In regard to claims 8, 23, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, wherein

performing said trigonometric transformation comprises obtaining a value of a trigonometric

function of an argument from a look-up table (set of contents of all memory locations which read

on look up table). See col.11 lines 30-46.

10.   In regard to claims 9, 24, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, further comprising

generating rotated coordinates corresponding to said first voxel, said rotated coordinates

corresponding to rotation about a selected angle. See Fig.13.

11.   In regard to claims 12, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, wherein said look-

up table has a number of entries that is at least double the number of angular positions at which

said screen can be positioned (set of contents of all memory locations which read on look up

table). See col.11 lines 30-46.

12.   In regard to claims 13, 28, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, wherein rendering

said selected voxels on said screen comprises applying a Bresenham algorithm to obtain said

selected voxels on the basis of said intersection of said desired line with said entry plane and said

projection onto said entry plane of an intersection of said desired line with an exit plane. It is

inherent that Bresenham algorithm is mostly used in drawing line.

13.   In regard to claims 14, 29, Soltan teaches a method for rendering, on a volumetric display

having a plurality of voxels, a rasterized line that approximates a desired line, further

comprising: providing a first processor dedicated to carrying out said rendering of selected

voxels on said screen to rasterize said connecting segment; and providing a second processor in

communication with said first processor to provide said first processor with information

indicative of said desired line. It is inherent that every computer has graphic processor for

rendering lines or polygons, and a CPU (Central processing unit) for controlling the operation of

the computer system.

14.   In regard to claims 15, 30, Soltan teaches a method of rendering a desired line in a

volumetric display having a rotatable screen, said method comprising: stepping said rotatable

screen through a sequence of angular positions; See Fig.11, col.8 lines 15-20; and at each angular

position, rendering, on said rotatable screen, a rasterized approximation of a line segment

containing an intersection of said desired line and said rotatable screen (rendering voxels which

forms lines of edges for cursor cube). Fig.10, col.16 lines 15-50.

Allowable Subject Matter

15.   Claims 10, 11, 25, 26, are objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the base

claim and any intervening claims.

Conclusion

16.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Tam D. Tran** whose telephone number is **571-272-7793**. The

examiner can normally be reached on MON-FRI from 8:30 – 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Matthew Bella** can be reached on **571-272-7778**. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tam Tran

TT

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